A.D. 1868, Sep. 8, № 2763,
STOCKER & EDGLEY'S Specification.

FIG. 14 $\frac{a}{11}$

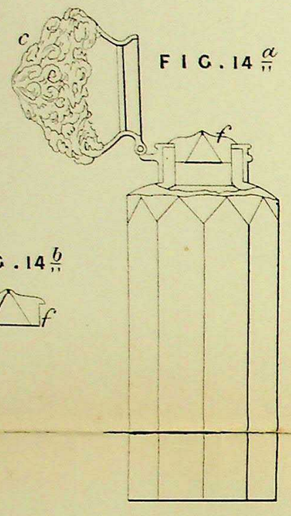


FIG. 14 $\frac{b}{11}$

FIG. 1.

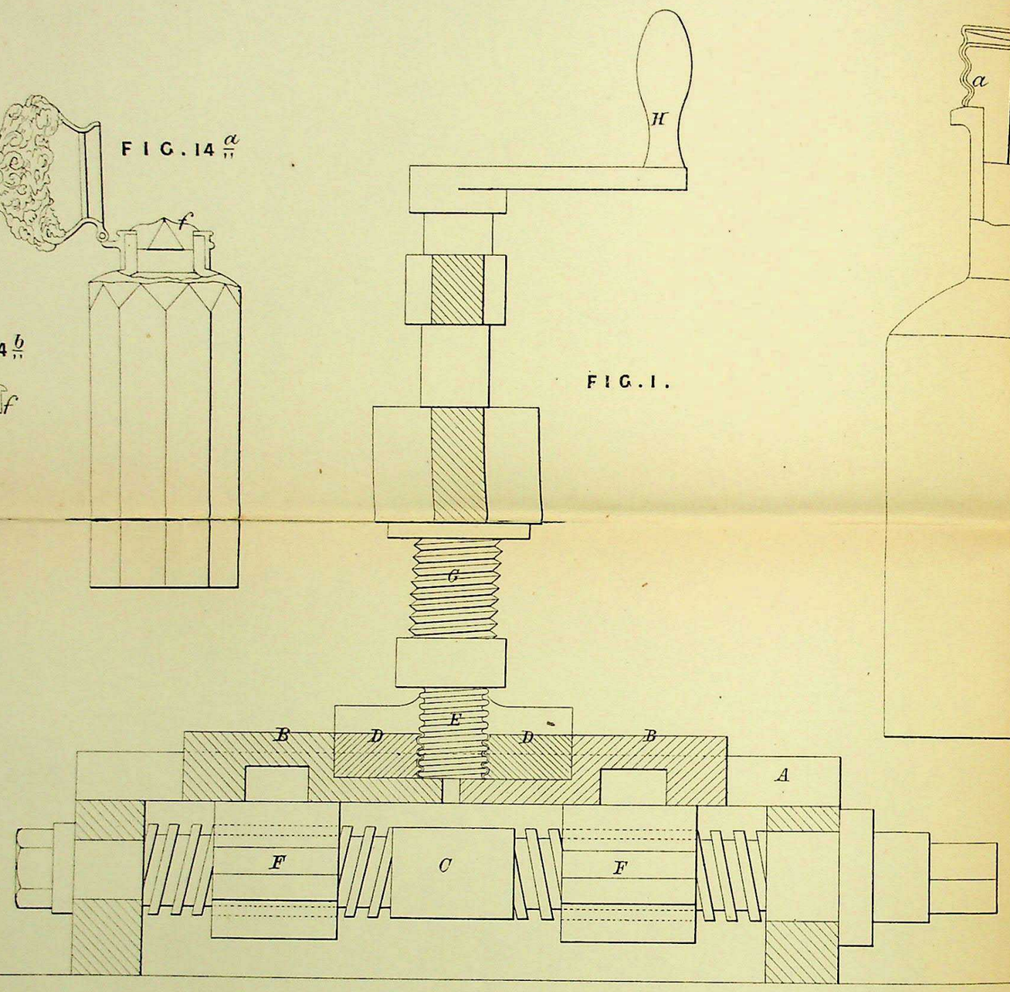


FIG. 17.

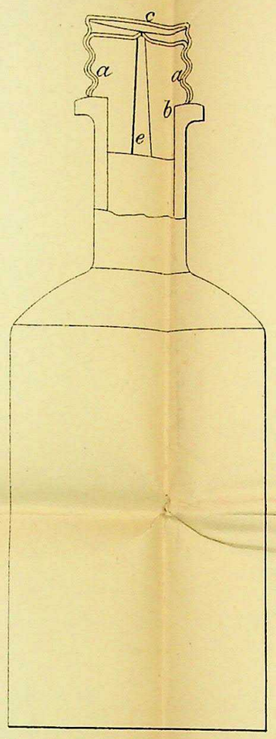


FIG. 2.

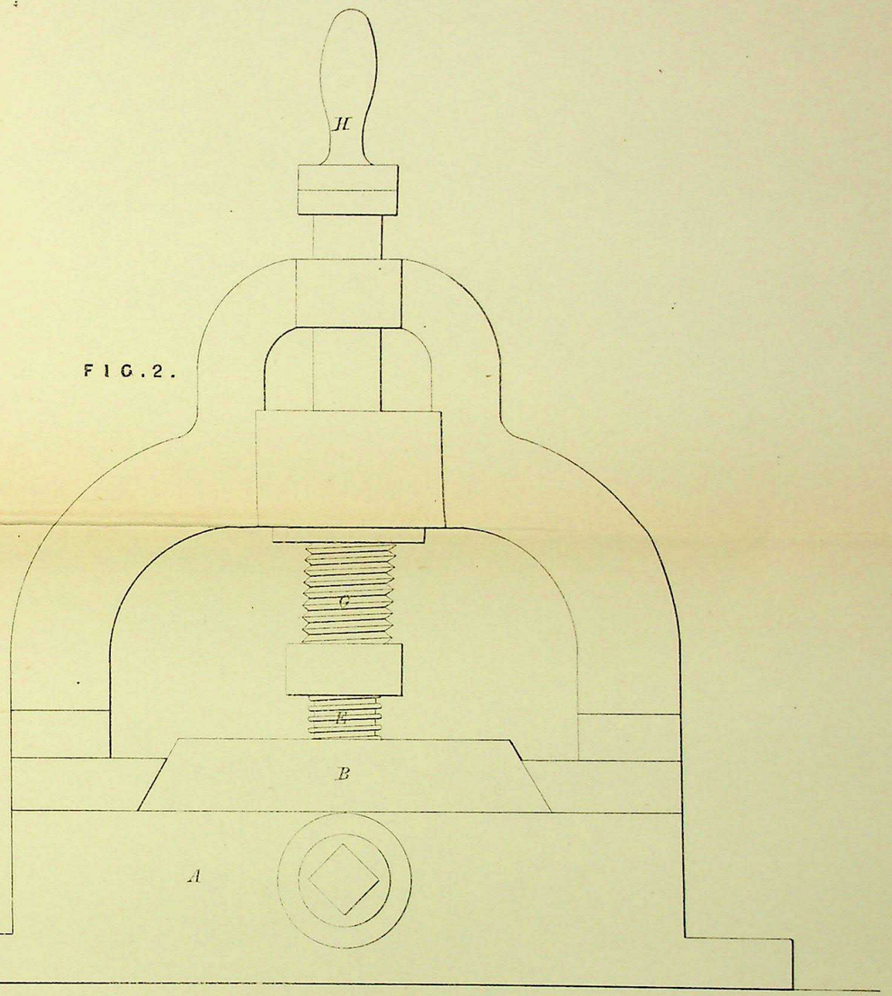


FIG. 5.

FIG. 3.

FIG. 4.

FIG. 6.

FIG.5.

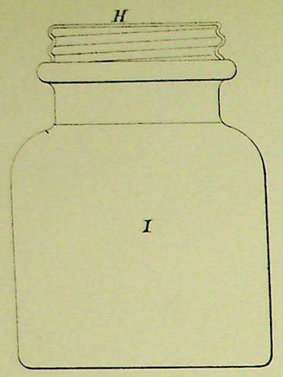


FIG.5 $\frac{a}{11}$

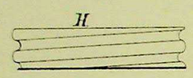


FIG.3.

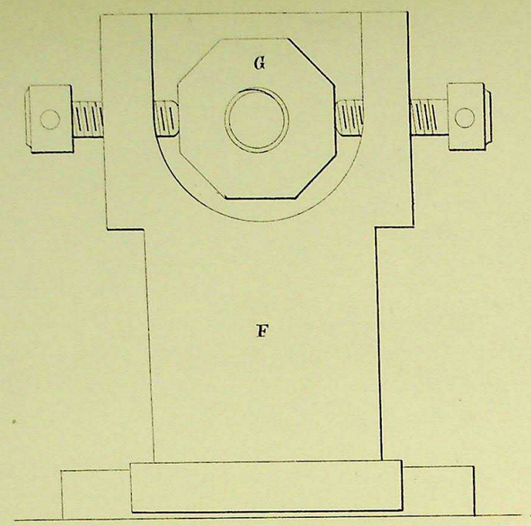


FIG.4.

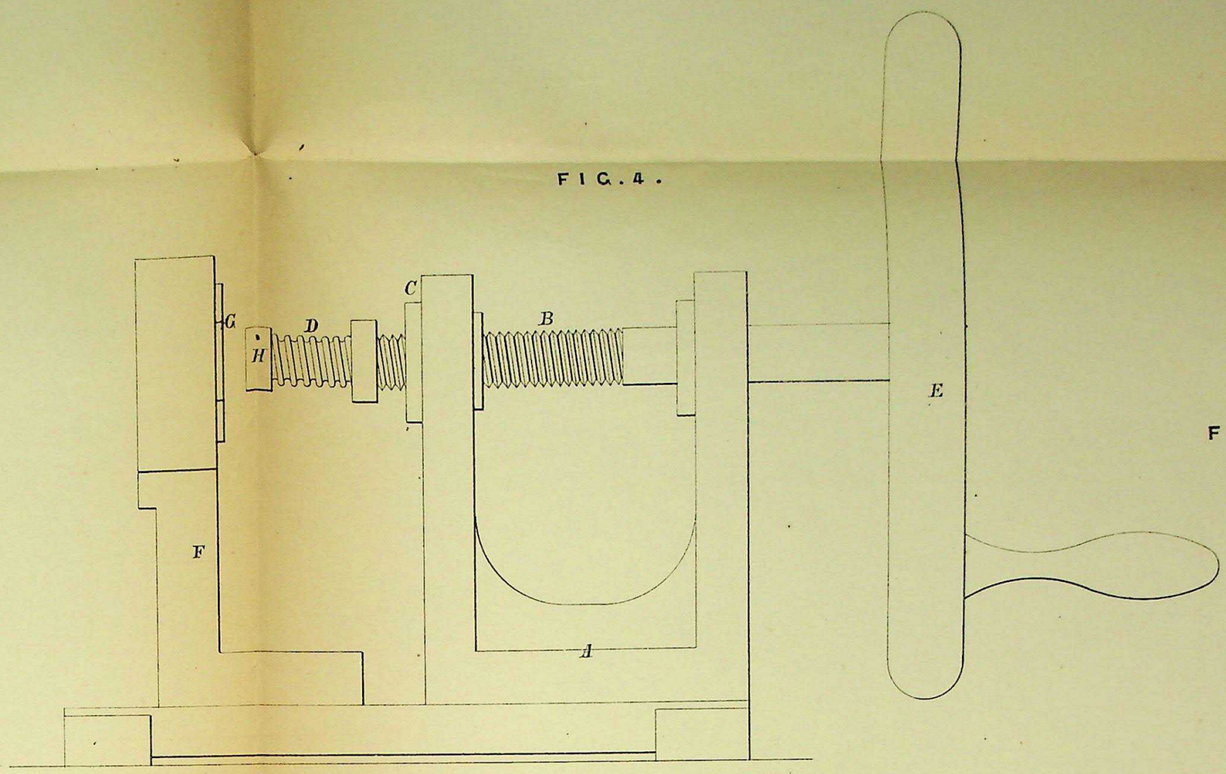


FIG.6.

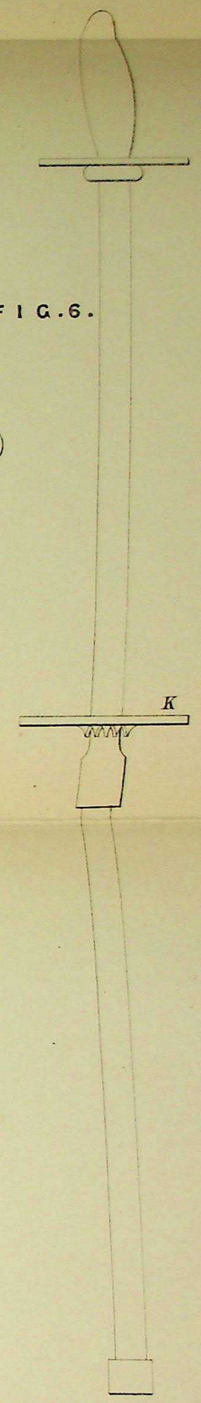


FIG.7.

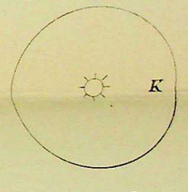


FIG.8 $\frac{a}{11}$

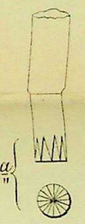


FIG.8.

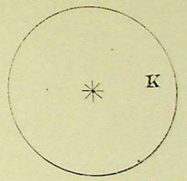


FIG.9.

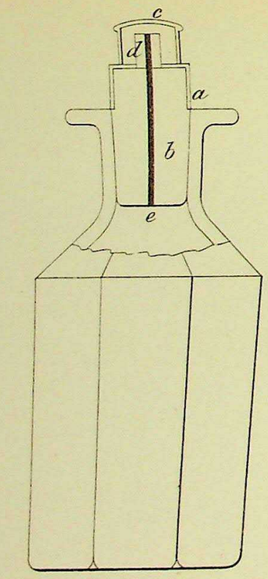


FIG.10.

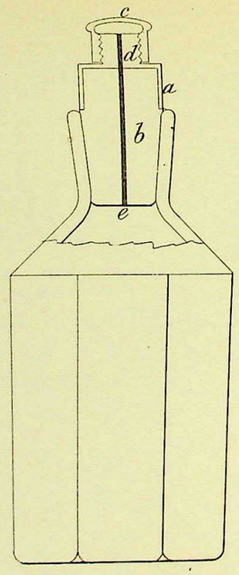


FIG.11.

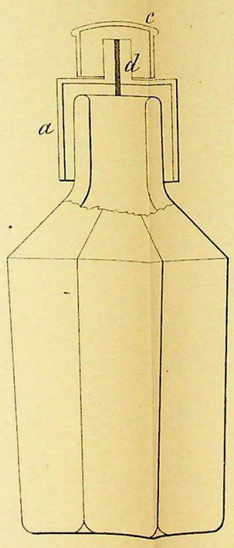


FIG.12.

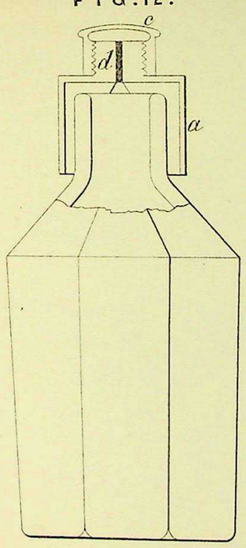


FIG.9 $\frac{a}{11}$

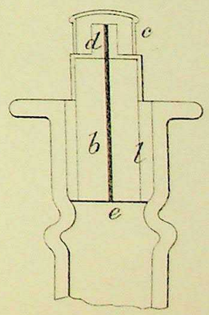


FIG.13.

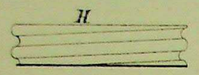
FIG.14.

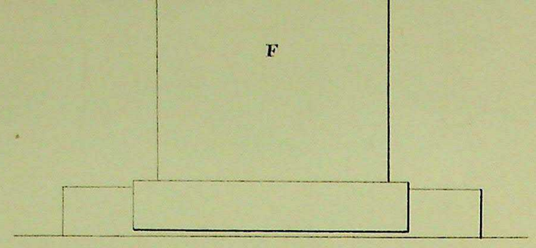
FIG.15.

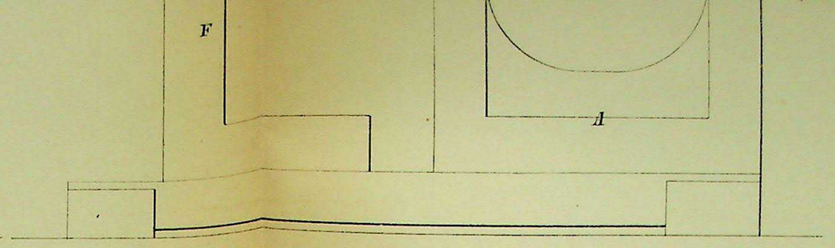
FIG.12 $\frac{a'}{11}$

FIG.16.

FIG. 5 $\frac{a}{n}$







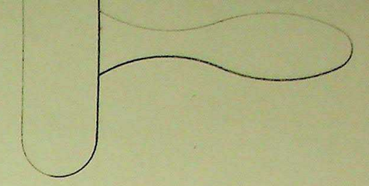
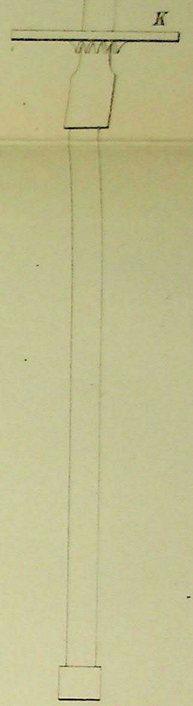


FIG. 7.



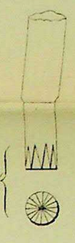


FIG. 8 $\frac{a}{n}$

FIG. 8.

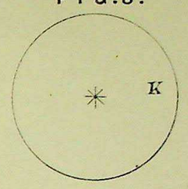


FIG. 9.

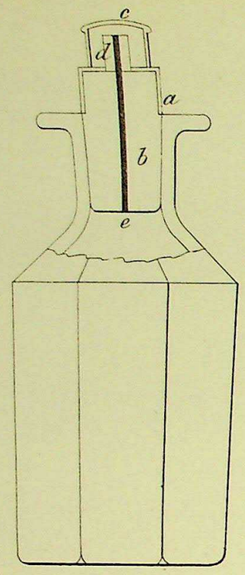


FIG. 10.

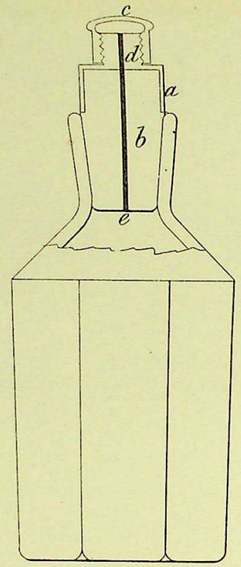


FIG. 11.

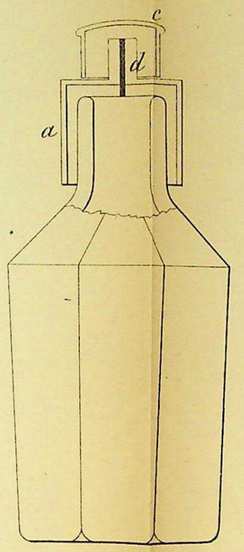


FIG. 12.

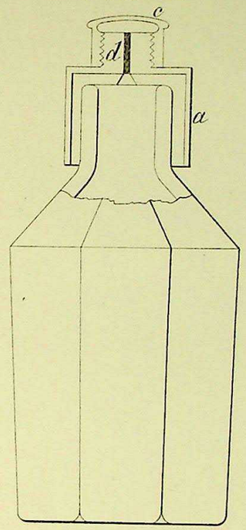


FIG. 9 $\frac{a}{n}$

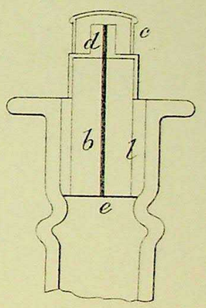


FIG. 13.

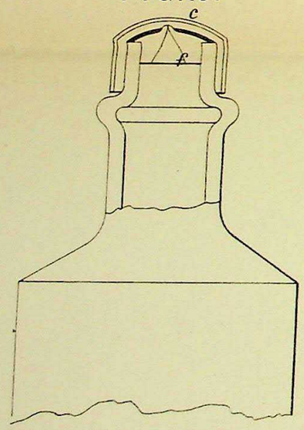


FIG. 14.

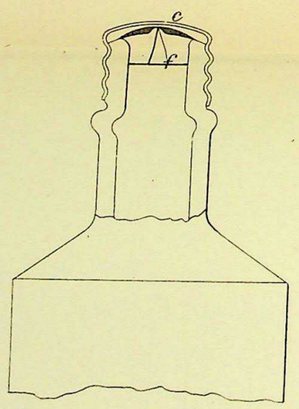


FIG. 15.

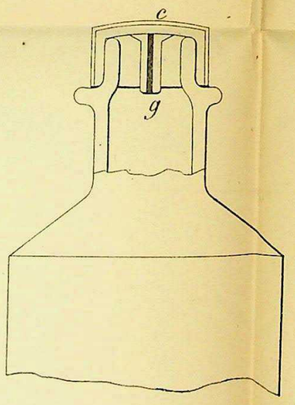


FIG. 12 $\frac{a}{n}$

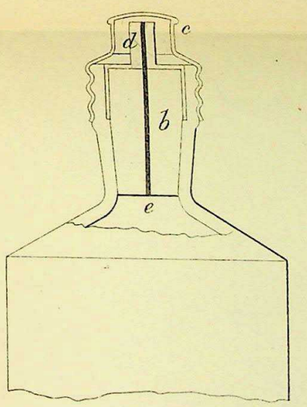
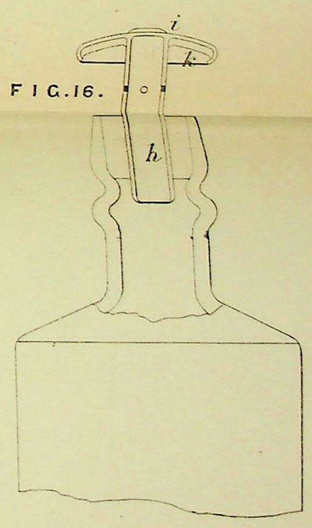


FIG. 16.



The filed drawing is partly colored.

Drawn on Stone by Malby & S

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1869.

A.D. 1868, 8*th* SEPTEMBER. N° 2763.

Hollow Caps and Stoppers for Bottles, &c.

LETTERS PATENT to Alexander Richmond Stocker, of New Cross, Glass Manufacturer, and John Alfred Edgley, of Lamb's Conduit Street, Practical Engineer, for the Invention of "IMPROVEMENTS IN HOLLOW CAPS AND STOPPERS, AND THE EMPLOYMENT OF THEM WITH BOTTLES AND OTHER VESSELS, AND IN THE MACHINERY, APPARATUS, OR MEANS TO BE USED FOR PRODUCING PART OF THE SAME, ALSO IMPROVEMENTS IN THE ARTICLES TO BE EMPLOYED WITH SUCH OR OTHER CAPS, AND THE MEANS FOR CONSTRUCTING THEM."

Sealed the 26th January 1869, and dated the 8th September 1868.

PROVISIONAL SPECIFICATION left by the said Alexander Richmond Stocker and John Alfred Edgley at the Office of the Commissioners of Patents, with their Petition, on the 8th September 1868.

We, ALEXANDER RICHMOND STOCKER, of New Cross, Glass Manufacturer, and JOHN ALFRED EDGLEY, of Lamb's Conduit Street, Practical Engineer, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN HOLLOW CAPS AND STOPPERS, AND THE EMPLOYMENT OF THEM WITH BOTTLES AND OTHER VESSELS, AND IN THE MACHINERY, APPARATUS, OR MEANS TO BE USED FOR PRODUCING PART OF THE SAME, ALSO IMPROVEMENTS IN THE ARTICLES

TO BE EMPLOYED WITH SUCH OR OTHER CAPS, AND THE MEANS FOR CONSTRUCTING THEM," to be as follows :—

We manufacture and employ with bottles and other vessels caps or covers with screws formed on their outer diameters as well as in their inner peripheries, which we effect by an apparatus or machine having side travelling movements caused by the action of right and left handed screws held in a carrier or guide box for that purpose, the motions being given by the aid of a lever or other convenient means. A screwed perpendicular shaft also fixed therein is acted upon by another lever or other convenient means, which shaft enters and bottoms itself down into the cap which is placed in the machine for the purpose of being screwed, when the motions for screwing are acted upon rendering the cap complete; the screwed shaft is then raised out of the cap and the operation repeated, and so on. The stopper to which we refer is made hollow with a head to it, and fits into a cork in the neck of the vessel; holes are made in this stopper for the purpose of allowing the liquid to pass thro' without releasing the stopper from the vessel.

We do not confine ourselves to the precise means described for screwing caps as they may be varied for the purpose of producing screws both on the outside and inside of caps. Some of these caps will have holes provided in their crowns for the purpose of holding and employing therewith vulcanized india-rubber articles made according with a further part of our Invention, which is as follows, viz., we mould, dip, make up in pieces, or otherwise construct the teats of infants' feeding bottles and the tubes generally employed therewith in one piece, which by preference we effect by the aid of moulds and cores, and we manufacture and employ with such or other caps or covers pieces of india-rubber or other suitable material with peculiar perforations, cuttings, or incissions therein for the purpose of simplifying and rendering them more economical, complete, and perfect than the means hitherto employed. The peculiar perforations or incisions to which we refer consists of a round disc of india-rubber placed in the crown of the cap and screwed down on to the top of the bottle or other vessel, thereby causing an air-tight fitting or joint, and having cuttings, perforations, or incisions cut through the centre thereof for the purpose of holding therein the ordinary tube used generally with feeding bottles or our improved tube, such perforations being made of a shape that will hold or colapse the tube sufficiently tight and at the same time admit sufficient air into the vessel

so that the infant may draw its food therefrom without difficulty, while this mode of proceedure will by the elasticity of the india-rubber prevent a leakage at the part, which is the case generally with infants' feeding bottles.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Alexander Richmond Stocker and John Alfred Edgley in the Great Seal Patent Office on the 8th March 1869.

TO ALL TO WHOM THESE PRESENTS SHALL COME, we, ALEXANDER RICHMOND STOCKER, of New Cross, Glass Manufacturer, and JOHN ALFRED EDGLEY, of Lamb's Conduit Street, Practical Engineer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eighth day of September, in the year of our Lord One thousand eight hundred and sixty-eight, in the thirty-second year of Her reign, did, for Herself, Her heirs and successors, give and grant unto us, the said Alexander Richmond Stocker and John Alfred Edgley, Her special licence that we, the said Alexander Richmond Stocker and John Alfred Edgley, our executors, administrators, and assigns, or such others as we, the said Alexander Richmond Stocker and John Alfred Edgley, our executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN HOLLOW CAPS AND STOPPERS, AND THE EMPLOYMENT OF THEM WITH BOTTLES AND OTHER VESSELS, AND IN MACHINERY, APPARATUS, OR MEANS TO BE USED FOR PRODUCING PART OF THE SAME, ALSO IMPROVEMENTS IN THE ARTICLES TO BE EMPLOYED WITH SUCH OR OTHER CAPS, AND THE MEANS FOR CONSTRUCTING THEM," upon the condition (amongst others) that we, the said Alexander Richmond Stocker and John Alfred Edgley, our executors or administrators, by an instrument in writing under our, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to

be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that we, the said Alexander Richmond Stocker and John Alfred Edgley, do hereby declare the nature of our said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Our said Invention consists in the application to and employment with bottles and other similar vessels of hollow caps and stoppers, and in some instances in constructing and combining them with their necessary appendages in such manner as to render them more convenient in their uses for the various purposes to and with which they are intended to be applied and employed.

In the first instance we will refer to our improved processes for the manufacture of certain hollow caps or stoppers composed of sheet metals of exceedingly thin guage, such, for instance, as what are known and technically called tin'd iron, tagger plates or black taggers, brass, or such like metal or metals as will be elastic and springy (both previously and subsequently to the manufacture of such hollow caps or stoppers), and which will yield easily to the processes of manufacture, and readily and most easily producing thereon and therein screws without exerting much pressure, strength, or labour, which is easily accomplished by the labor or power of boy's hand; such peculiar hollow caps or stoppers will be found useful, effective, and convenient when employed for the various purposes of our Invention, as herein-after explained. In manufacturing a hollow screwed cap or stopper suitable to be supplied to an ordinary two-ounce pomade bottle, for example, provided with a screw produced on the neck thereof by blowing in the ordinary manner of bottle making for the reception of such hollow cap or stopper we proceed in the following manner, that is to say, we take sheet metal of the category before mentioned (the metal must not be of a soft character and cut out of it in the ordinary manner of procedure round blanks or discs of desirable dimensions, from which we produce a hollow cap or stopper of the required size by operating upon it by the process or processes of what is known and technically called "drawing through" or "raising" by the aid of tools fixed in a fly press or otherwise, whereby we form the said blank into a plain unscrewed hollow cap or stopper, which process is well known and in common daily use. We now

operate upon the said hollow cap or stopper by the aid of the machinery or apparatus herein-after described and illustrated by the Sheet of Drawings hereunto annexed.

Figure 1 of the Drawings represents a longitudinal vertical section of one form of our improved machine for producing a screw thread on the outer and inner surfaces of the plain sides of the hollow cap or stopper above referred to, and Figure 2 is a corresponding end elevation of the same. In these Figures A represents a cast-iron stand upon which work the two dovetail slides B, B, carrying the two dies D, D, which contain the counterpart of the screw thread to be produced. On the hollow cap or stopper E is a screwed mandril the screw thread on which correspond to that formed on the bottle neck to which the hollow cap or stopper is to be fitted; the dies D are opened or closed on the hollow cap or stopper which is deposited between the dies with its open side upwards and immediately underneath the bottom of the mandril E. Before the dies are caused to grip the cap the mandril E is brought down into the hollow cap or stopper by the action of the screw spindel G to which the mandril E is fitted by a ring and set screw or otherwise, the handle H serving to actuate the screw G. Whilst the hollow cap or stopper is being firmly held down upon the base A by the mandril E the two dies D, D, are caused to approach on opposite sides by the action of the nuts F, F, upon the sides B, B, such nuts working along the right and left hand screw spindle C rotated by a handle or otherwise; the effect of this is to indent a counterpart of the screw thread on the dies and mandril E into the sides of the hollow cap or stopper. By reversing the motion of the screw G the mandril E will be unscrewed or released from the hollow cap or stopper which is then complete, and on withdrawing or separating the dies B the now screwed hollow cap or stopper may be removed and a fresh one introduced, when the operations are repeated.

Figures 3 and 4 represent respectively an end and side elevation of a modified form of machine for producing these hollow caps or stoppers. In these two Figures A represents a cast-iron frame carrying a screw spindle B working in a nut C and being bored up at its front end for the reception of a screwed mandril D. This mandril D, as well as the mandril E in the first described machine, may be readily removed and replaced by other mandrils of various sizes according to

the size required to be produced. On the rear end of the screw spingle there is fitted a fly wheel and handle E, by which it is worked backwards and forwards as required. F is a metal frame into which is secured by set screws or otherwise the screwed die G. The opening in the die G is made completely through it, and is by preference tapered or diminished slightly in diameter from the end at which the mandril D enters to the opposite or delivery end of the said screwed aperture; the plain metal hollow cap or stopper H is placed upon the end of the screwed mandril D, as shewn in Figure 4, and the fly wheel and screw spindle are rotated, thereby causing the mandril D to force the hollow cap or stopper H by a combined forward and rotatory motion through the die G delivering it on the opposite side of the die. By making the thoroughfare in the die slightly tapered the screwing action of the die and mandril combined will be more easily and gradually exerted upon the cap, causing it to enter the die with facility. This hollow cap or stopper having undergone the operation of screwing will now assume the appearance shewn at Figures 5 and 5ª, and any device, name, trade mark, or design may be embossed thereon (by the aid of stamping in the ordinary manner) either previously or subsequently to the cap or stopper having been screwed. The two-ounce pomade bottle herein-before referred to is shewn at Figures 5 with the screwed cap or cover screwed thereon, H representing the screwed hollow cap or stopper (detached at Figure 5ª) and I the bottle.

Another part of our Invention consists in the manufacture of hollow caps or stoppers (by the same process or processes and out of metal or metals of the same category as that previously mentioned), and in the application to and employment of such screwed caps or covers with infants' feeding bottles, also in manufacturing or constructing and employing therewith part of the articles to be used in combination with the remainder of those now in ordinary use, so to render our improved combined apparatus complete.

Some of our improvements so far as they relate to manufacturing or constructing and employing therewith part of the articles to be used have reference to the disc of india-rubber to the teat used by the infant for suction for the purpose of drawing the food from the vessel and to the india-rubber tube connected therewith. In carrying out this part of our said Invention we take a feeding bottle with a screw produced on the neck thereof by blowing, as in the ordinary manner of bottle making

for the purpose of receiving thereon a screwed hollow cap or stopper, which we produce in the same manner as herein-before described with the exception, as will be seen, that it is somewhat varied in size, configuration, and construction, inasmuch as it has a hole provided therein for the purpose of carrying the ordinary glass tube and the india-rubber tube with its teat and shield.

We manufacture the india-rubber infants' feeding bottle tube and teat together in one piece, as shewn at Figure 6, and thereby supersede the use of the union joint which usually connects the tube and teat together, and by preference we produce these articles according to our Invention in the following manner:—We build them up in pieces to the configuration of the tube, the roll or frill (which acts as a stop for the shield) and the teat; or we make them up in pieces (solutioning the parts necessary to be joined and afterwards dip them for the purpose of rendering them stronger and more sightly; or we dip them in their entirety in the ordinary method of dipping, and afterwards inflate them or not as circumstances may require, treating and vulcanizing them in the ordinary manner. By preference we place them previously to their being vulcanized in two-half nicely fitted dies with which cores may or may not be used, or they may be treated and finished in any convenient manner well known and in common use.

Our improvements in the disc of india-rubber used in the hollow cap or stopper consists in causing incisions, star cuts, or similar or other suitable perforations or cuttings to be made therein at the centre thereof. Two of these improved discs are shewn at K in Figures 7 and 8, in the one case the star cuts are combined with a circular opening and in the other case the star cuts alone are used. Figure 8ª shews the tool employed for producing these star cuts. When the india-rubber tube has been threaded through the disc K for use, as shewn in Figure 6, the star cuts in such disc will exert a very mechanical self-acting leverage and soft action on that part of the tube enclosed by them, enabling the food to be drawn from the vesssel more freely and with unusual comfort to the infant, whilst the collapsing of the serrated tooth-like or star cuttings or formations, as shewn, will be self-acting, thereby rendering the vessel at all times clean and unleaky.

A further part of our Invention relates to the manufacture and construction of hollow caps or stoppers intended to be employed with what are called and known in the trade as essence, scent, perfume, or such like

bottles, and has for its object not only to prevent waste of these expensive liquids, but to distribute them more conveniently and in a more minutely dispersed or divided state by causing the liquid in its egress from the bottle to sprinkle the article or surface instead of being poured thereon from the bottle mouth, whereby a given quantity of the liquid may by the slightest movement of the vessel be deposited in the hand or on the handkerchief, or distributed in any desired place in the most desirable and convenient manner, thus avoiding the waste of any superfluous quantity of the liquid.

In the first place we produce by the aid of "drawing through," or raising tools, or in any other convenient manner a hollow cap or stopper *a*, as shewn at Figure 9, having a hollow cork *b* firmly and permanently fixed therein, as also a removable metal head piece *c* lined with cork or other convenient material round its inner periphery as well as at its crown, which head piece fits on to the end of a small nozzle *d* formed on the hollow cap or stopper *a*, and communicating with a small orifice or opening *e*, passing completely through the cork for the purpose of stopping the vessel from leaking after it has been used. This head piece *c* may be screwed, as seen at Figure 10, on to the contracted sprinkling nozzle *d*, in which case the lining round the interior of the head piece *c* will be dispensed with, although the use of the elastic part at its crown will be retained, it being intended to cushion down upon the top of the nozzle *d*, thereby stopping effectually by the action of the screw or other provision made for the purpose any egress of the liquid from the vessel except when required for use. The hollow corks *b* are forced and tightly secured into the metal caps *a*, so as to form convenient hollow stoppers, which may be fitted either into the necks of bottles having cork rings or linings *l* secured therein, as shown at Figure 9ª, or may be most conveniently used by perfumers and others and applied to various shaped bottle necks and bottles as ordinary corks are now used, thereby combining the advantages of a tight fitting stopper and a perfect perfume sprinkler. The hollow cork may be dispensed with, and the cap or stopper *a* may be lined with cork round its inner periphery and fitted on to the outside of the bottle neck, as shewn at Figure 11, the head piece *c* being also lined with cork round its inner periphery and fitted on to the smooth nozzle *d*. In Figure 12 the head piece *c* is screwed on to the screw nozzle *d*, or the head piece may be screwed direct on to the necks of bottles having screws provided thereon

for its reception, as shown at Figure 12ª, or it may be fixed on to the bare neck of the bottle (by cementing or otherwise). Without the aid of the screw or cork lining therein, as herein-before mentioned, (as it would be according to this method,) by reason of its being permanently fixed on to the bottle the latter could not be replemished when the contents of the vessel become exhausted, since in attempting a removal of the cover destruction would arise and the vessel would become useless, whereas with hollow caps or stoppers constructed and applied as herein-before described the bottle may be refilled again and again in like manner to ordinary bottles.

Figure 13 represents another modification of this part of our Invention, wherein the orifice or mouth of the bottle receives a moulded vulcanised india-rubber (or other material suitable for the purpose) disc *f*, so shaped as to fit tightly round the inner part of the bottle neck and down upon the surface or lip thereof, causing thereby a doubly secure fitting. The substances may be of porcelain, or other discs having names, devices, and trade marks embossed thereon, but in these instances the bottle neck would have to be lined with cork or other flexible or other material or materials, or other provision to be made for the purpose of retaining such disc firmly in the orifice of the bottle. The head piece *c*, herein-before referred to, is employed for the purpose of screwing or fitting down upon the hole or holes provided in the disc *f*, in order to prevent the egress of the liquid contained in the bottle. The outside of the bottle may either be left plain, as in Figure 13, for the reception of a cork lined head piece, or the bottle neck may be screwed to receive a screwed head piece, as in Figure 14, the object of the head piece being to cushion down upon and keep liquid-tight the hole provided in the rubber disc *f* fitting into the orifice of the bottle. Figure 14ª represents the application of the finely perforated india-rubber disc or stopper *f* to an ordinary scent bottle provided with the well-known hinged metal cap or cover *c*. One of our perforated india-rubber discs is shewn detached at Figure 14ᵇ.

Another modification of our improvements in perfume sprinklers consists in constructing and adapting to bottles for the purpose above-mentioned hollow stoppers consisting of ordinary corks having a hole provided therethrough of desirable size for the reception of and for

holding permanently therein the hollow pin *g*, as shewn at Figure 15. The cork is first placed (in the ordinary manner of corking) into and cut off fair or flush with the surface of the bottle neck or hole having been provided therein for the reception of the hollow pin *g*, which is then placed into and forced down to its shoulder on the top of the cork, when a head piece, as herein-before described, is applied to the vessel in the same manner and for the like purpose, also herein-before mentioned. The hollow pin *g* may, if desired, be dispensed with, and the hollow cork stopper alone may be used, but it would not be so convenient nor could the vessel be refilled, since the hollow cork stopper being a fixture could not be removed without destruction, and thereby rendered useless, as in the instance herein-before referred to.

Another form of perfume sprinkler is shewn at Figure 16; it consists of a hollow cork, which is permanently inserted into the neck of the bottle, and through which slides a cylindrical drawn metal tube *h* having a flat, or mushroom, or other shaped head piece *i* soldered thereon and closing the outer end thereof, as shewn. (This head piece is cut out and afterwards stamped into its shape, and its milling is at the same time accomplished by the process of stamping, not milled in the ordinary manner.) A number of small lateral perforations are made near the upper part of the sliding tube, and a disc of india-rubber *k* is fitted round the tube inside the top or cap piece *i* for the purpose of preventing or checking any leakage from the bottle when the tube is pushed down through the cork so as to bring the disc *k* in contact with the bottle neck, and thereby act as and performing a second stopping. In this condition the lateral perforations will be closed by the surrounding cork, but when the tube is drawn out partially, as shewn, the perforations will be exposed, and the liquid contents of the bottle may be sprinkled out. When it is required to replenish the bottle the tube *h* is entirely withdrawn, taking care that a sufficiently large opening in the cork for the convenient introduction of a further supply shall at all times be observed. Figure 17 represents an ordinary scent bottle wherein the usual ground glass stopper is replaced by one of our hollow stoppers. The stopper *b* may be made of cork, and have an enlarged head or shoulder formed thereon resting or fitting down upon the top or lip of the bottle, as shewn (or the ordinary shaped corks may be as conveniently used and employed as circumstances may require, or according

to taste). This enlarged head is screwed or placed into a screwed hollow stopper *a*, produced or manufactured by the same or equivalent machinery to that herein-before described. *e* shews the small sprinkling passage or orifice made therethrough, a fine perforation being made in the crown thereof to correspond with such passage *e*. The small sprinkling orifice is closed by screwing down upon the hollow cap or stopper *a* the screwed head piece *c* made in the same way as and of similar metal to the hollop cap or stopper *a*, a piece of cork, india-rubber, or other suitable material being inserted into the crown of the cap *c* to close liquid-tight the sprinkling orifice.

Having now described the nature of our said Invention, what we claim is,—

1st. The manufacture and employment of screwed thin sheet metal hollow caps or stoppers intended to be screwed on to the necks of bottles and other like receptacles, as herein-before described.

2nd. The providing a hole in such screwed sheet metal caps for the reception of the tube, holding and carrying therein also the appendages of an infant's feeding bottle, as herein-before described.

3rd. The peculiar construction and arrangements of machinery or apparatus for making the before-mentioned sheet metal screwed caps, as herein-before described.

4th. The construction and use of hollow stoppers provided with one or more contracted openings or thoroughfares for the purpose of enabling the contents of a scent bottle to be sprinkled out without removing the stopper, such contracted thoroughfares being closed by a removable head piece, the whole being arranged and employed substantially as and for the purpose herein-before described.

5. The peculiar construction, arrangement, and mode of combining the tubes, teats, and discs of infants' feeding bottles, as herein-before described.

6. The peculiar mode of perforating the discs of infants' feeding bottles, as and for the purpose herein set forth.

7. The peculiar reconstruction of stoppers, and their application to scent bottles, as and for the purposes herein-before described and

illustrated by Figures 9, 9ª, 10, 11, 12, 12ª, 13, 14, 14ª, 14ᵇ, 15, 16, and 17 of the Drawings hereunto annexed.

In witness whereof, we, the said Alexander Richmond Stocker and Alfred Edgley, have hereunto set our hands and seals, this Eighth day of March, in the year of our Lord One thousand eight hundred and sixty-nine.

ALEXANDER RICHMOND STOCKER. (L.S.)
JOHN ALFRED EDGLEY. (L.S.)

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